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A NEW CROCODILIAN FROM THE BELLY RIVER BEDS

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INTRODUCTION

In the collection of fossil reptiles in The American Museum of Natural History is a small crocodilian skull collected by Barnum Brown and Peter Kaisen in 1914 from the Belly River Beds along the Red Deer River in Alberta, Canada. The skull is somewhat crushed, and some parts are missing. Enough is preserved, however, to permit description and determination of affinities. The shape of the skull and some of its characters suggest close affinities to *Leidyosuchus canadensis* Lambe. In a large measure the preservation of the skull does not correspond to that of the type of this species. The locality and level of *L.*

canadensis correspond in general with those of the specimen described, but they may not be identical.

Detailed comparison between the comparable parts of the *L. canadensis* type and the American Museum specimen reveals a considerable degree of similarity and also a considerable degree of difference. The differences noted are concerned with characters which experience has shown to be of taxonomic value. The American Museum specimen is therefore referred to a new species, to which the name *Leidyosuchus gilmorei* is applied in honor of Dr. C. W. Gilmore of the United States National Museum.

DESCRIPTION

Leidyosuchus gilmorei, new species

TYPE.—Skull, Amer. Mus. No. 5352.

TYPE LOCALITY AND LEVEL.—Red Deer River, Alberta, Canada. Belly River Beds.

DIAGNOSTIC CHARACTERS.—Characters of the genus *Leidyosuchus*; large external narial aperture that does not extend behind the level of the last premaxillary teeth; distinct but shallow U-shaped groove on the surface of the snout, roughly paralleling its borders; anterior ends of external borders of maxillary distinctly convex outward; notch deep; supraoccipital bone participating in the superior surface of the cranial table.

GENERAL FORM OF THE SKULL

The specimen is somewhat flattened by crushing.

The skull is small, being less than 23 cm. in length. It is moderately broad posteriorly in proportion to its length. Its snout is also relatively short and broad. The tip of the snout is not preserved, but the anterior border was evidently in the form of a slightly flattened semicircle, the flattening being at the tip. The sur-

face of the snout is somewhat less roughened by pitting than is usual in eusuchian crocodiles, there being small areas of smooth bone between pitted areas. There is a shallow, irregularly U-shaped groove on the snout, crossing maxillary, premaxillary and nasal bones.

The cranial table is not well preserved, but it is evident that it was not sharply separated from the snout in level. The quadrate processes were evidently rather short.

CAVITIES OF THE SKULL

The anterior border of the *external narial aperture* is missing, but enough is preserved to indicate that the aperture was large and that its breadth considerably exceeded its length.

The *orbits* are very large and are subcircular in form. They are approximately as long as broad and are spaced moderately far from each other.

The *supratemporal fenestrae* have only their internal, and parts of the anterior and posterior borders preserved; they were evidently much smaller than the orbits and were probably broader than long. They were spaced moderately far apart.

On the palate the borders of the *premaxillary foramen* are not preserved.

¹ Contribution to the Osteology, Affinities and Distribution of the Crocodilia, No. 38.

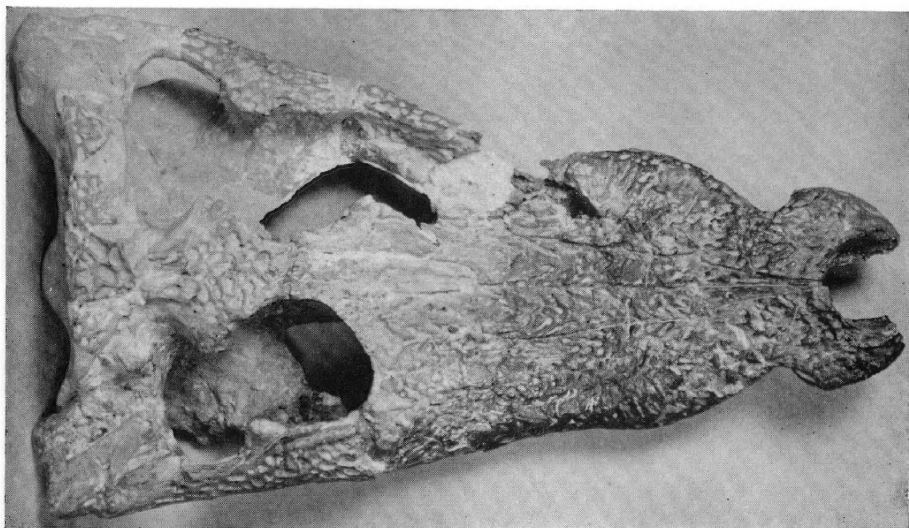


Fig. 1. *Leidyosuchus gilmorei*, new species. Type, skull, Amer. Mus. No. 5352. Superior view, one-half natural size.



Fig. 2. *Leidyosuchus gilmorei*, new species. Type, skull, Amer. Mus. No. 5352. Inferior view one-half natural size.

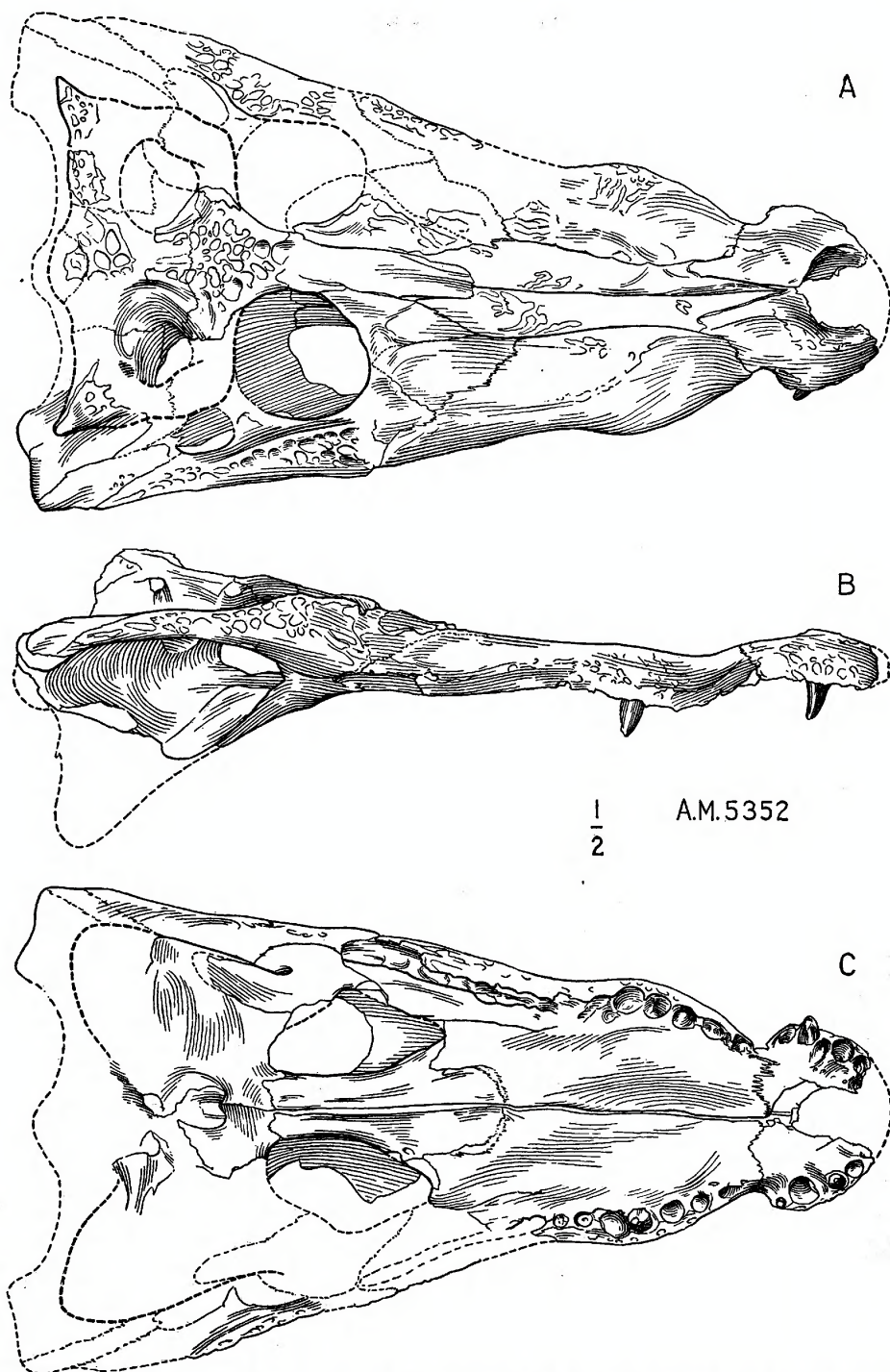


Fig. 3. *Leidyosuchus gilmorei*, new species. Type, skull, Amer. Mus. No. 5352. A, superior view; B, lateral view, right side; C, inferior view.

The borders of the right palatine fenestra are fairly complete, and the internal border of the left one is complete. These borders indicate that the fenestrae were moderately short and broad.

The internal narial aperture was heart-shaped, with the apex pointing posteriorly, and it was evidently located about midway between the anterior and posterior ends of the pterygoid bones.

THE BONES OF THE SKULL

The tips of the *premaxillaries* are missing. The bones are broad in spite of the fact that the notch is deep. The sutures with the nasals are straight and diverge slightly back to the point where the sutures with the maxillaries join them. At this point they turn abruptly and extend for a short distance transversely on each side to continue as premaxillo-maxillary sutures. These sutures then extend irregularly forward and outward to the notches. They cross the notches in a forward and downward direction and then extend in an almost straight line across the palate, considerably anterior to their usual position in the *Crocodylia*.

Four more or less complete alveoli are preserved in each premaxillary, and there must have been another alveolus in the missing tip. Considering this to be so, the left third and fifth and the right fourth alveoli contain teeth. The third and fourth teeth are subequal in size, the fourth being slightly larger than the third. They are nearly oval in horizontal section, but they are slightly keeled. No striations are visible. The fifth tooth is small and broken, and its characters are not evident.

The large fourth mandibular teeth must have bitten partly into the notch and partly into a pit, thus being intermediate between the conditions in the living *Alligator* and *Crocodylus*. Incomplete pits are visible in the specimen.

The *maxillaries* have short contacts with the premaxillaries, described above. The sutures with the nasals extend backward almost perpendicularly from the external end of the premaxillo-nasal sutures. In this backward extension the maxillo-nasal sutures bend slightly outward to the level of the seventh maxillary teeth. From this point each suture extends almost straight back to the level of the ninth maxillary teeth, where it ends at the anterior extremity of the lacrimal. Each maxillo-lacrimal suture extends outward and backward irregularly but without any decided change of direction. This direction is about 45° to the longitudinal axis of the skull. The maxillo-jugal sutures are not distinctive.

On the palate the anterior point, at the midline, of the maxillo-palatine suture is at the level of the tenth maxillary alveolus. The central portion of the two maxillo-palatine sutures is almost semicircular. The outer portions permit only a very small portion of the anterior border of each palatine fenestra to be occupied by the maxillary.

In each maxillary the alveoli increase regularly in size from the first to the fifth. The sixth and seventh alveoli are much smaller than the fifth, being about equal to the first in size. Behind the seventh the alveoli are missing on the left side and are not particularly clear on the right. Apparently there were seventeen maxillary teeth altogether on the right side. Undoubtedly several of these were in a common alveolar groove rather than in separate alveoli, but the point at which the change from one method of tooth insertion to the other takes place is not discernible.

The *nasal bones* are distinctive. At their anterior ends their tips barely reach the narial aperture. From this point they broaden rapidly to the posterior ends of the premaxillaries, where there is a sudden but slight expansion of the nasals. From that level, which is at the third maxillary teeth, they expand slightly to the level of the seventh maxillary teeth, then remain essentially constant in breadth to the anterior tips of the lacrimals. From the anterior ends of the lacrimals the nasals contract slightly to the anterior tips of the prefrontals. From this level they contract more rapidly to their own posterior tips, where the prefrontals join the frontal. The posterior tips of the nasals are separated by the long blunt anterior process of the frontal.

The *lacrimal bones* are large. Each of them extends forward a moderate distance beyond the prefrontal and has a shorter contact with the nasal than the prefrontal does. Each lacrimal occupies somewhat less than half the space between the frontal and the external border of the skull.

The *prefrontals* are comparatively small and are simple in outline. They are acuminate both anteriorly and posteriorly. They do not extend so far forward as the frontal.

The *frontal bone* is comparatively long and slender. It is coarsely pitted posteriorly and smooth anteriorly. It participates definitely in the anterior border of the supratemporal fenestrae. Its interorbital plate is moderately broad. Its anterior process is long and slender, extending considerably farther forward than the tips of the prefrontals. Although this process is slender, it is blunt anteriorly, distinctly separating the two posterior processes of the nasals from each other.

The *postorbitals* are not preserved, and the squamosals are preserved by a fragment only, rendering description impossible.

The *parietal* is coarsely pitted on the surface. It has a fairly broad interfenestral plate. It is short antero-posteriorly, being very short in proportion to the length of the frontal.

The *supraoccipital* is not well preserved, but enough of it is preserved to indicate that it occupied part of the superior surface as well as an appreciable portion of the postcranial border. Its relation to the foramen magnum cannot be determined.

The *basioccipital*, the *basisphenoid* and the *exoccipitals* are not preserved.

The right *quadrate* is partially preserved. It is somewhat crushed, but after making adequate allowance for that it is evident that it was unusually short.

The right *jugal* is preserved almost completely. It is not distinctive.

The *palatines* are short and broad. Their anterior processes are broader than the interfenestral plate and about half as long as this plate; these processes extend forward to the level of the tenth maxillary teeth. The interfenestral plate narrows progressively in the posterior direction; it extends back almost to the posterior ends of the palatine fenestrae.

The *pterygoids* are only partially preserved, but they indicate clearly the position of the internal narial aperture.

The right *ectopterygoid* is preserved but is somewhat crushed. It is not distinctive in characters.

MEASUREMENTS IN MM.

Length, tip of snout to supraoccipital border.....	214 est.
Length of snout.....	135 est.
Breadth of premaxillary expansion.....	50
Breadth at premaxillary constriction....	39
Breadth of snouth at fifth maxillary teeth.....	70
Breadth of snout at base.....	98
Length of right orbit.....	33 est.
Breadth of right orbit.....	33
Breadth of interorbital plate.....	14
Breadth of interfenestral plate.....	12
Length of right palatine fenestra.....	48

